

## Musica ficta

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*Written and implied accidental inflections*

Since the early 11th century European musicians have had at their disposal everything they needed to notate pitches unambiguously. In spite of this, composers of vocal polyphony until the end of the Renaissance, and even beyond, did not think they had to write down every accidental they required. They knew that some accidentals could be left out in notation, since singers would make the appropriate inflections anyway. We learn about the existence of this practice from the infrequent but express statements of theorists, such as the late 14th-century author who writes that 'in general, it is not necessary to notate [accidentals]'.<sup>1</sup> We learn, further, that most musicians wrote some accidentals down and left others out, although there was no agreement on exactly how much to notate. There was a tendency, however, to leave out particularly those accidentals needed to avoid melodic tritones and those inflecting cadential progressions. From the early 16th century on, writers on music advocated with increasing frequency that accidentals should always be written down.

The theorists explain why some accidental inflections were notated while others were not. Since some inflections were implied, as a matter of convention, by the musical context, composers could rely on singers to make them in performance regardless of whether the accidentals were written. To write them out was not necessary, but neither was it prohibited. Since not all contexts implied inflections with equal clarity, one might decide to provide some accidentals even if, strictly speaking, they were redundant. (In the choirbook or partbook formats it was easiest to spot the necessity of an inflection required by a melodic context, and almost as easy to discover one demanded by a cadential formula, but much more difficult to find one stipulated by a vertical relation.)

It is obvious, then, that the realization of implied accidental inflections belonged to the realm of performance practice. But if we are to avoid misconceptions about what medieval and Renaissance musicians did, we need a clear understanding of whether implied accidentals belonged to the domain of the musical text (which, for any given work, had to remain invariable from one performance to another if the work were to retain its identity), or to the domain of performance (which might vary from one realization of the text to another without endangering the identity of the work). The idea that an aspect of a work might be a matter of performance practice yet not belong to what I have defined here as the domain of performance but rather to the domain of musical text may appear bizarre

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only on the anachronistic assumption that the function of musical notation is to fix an ideal musical text existing independently of specific realizations, a modern attitude which did not become common until the late 18th century. For earlier musicians the function of notation was to provide adequate instruction for performers. This explains their pragmatic attitude that what was implied could be, but did not have to be, written down. Thus the practice of implying rather than specifying some accidental inflections does not necessarily mean that such inflections could not belong to the musical text.

In fact, it appears that the borderline between the domains of musical text and performance cut across the area of implied inflections. Once we have discussed the conventions which governed their use, it will become clear that many inflections belonged to the invariable musical text, since contexts that required them could be realized in only one way. But it will also be seen that the conventions allowed singers in certain situations to choose from among several available solutions. In some contexts musicians might legitimately hesitate whether to inflect or not, in others there might be no question that an inflection was required, but the choice of the specific inflection might be left open. We have evidence, moreover, that singers could occasionally disagree on how to realize the text.<sup>2</sup> Consequently, some implied inflections must be understood as belonging not to the invariable text but to its variable performing realizations.

Thus even though some contexts may have allowed performers to choose from among several acceptable solutions, for the most part we should think about the problem of implied inflections in terms of the intended musical text to be correctly realized by singers reading from a more or less abbreviated notation.<sup>3</sup> This way of seeing the problem will allow us to avoid the false track taken by those scholars who have argued that since implied accidentals were a matter of performance practice 'it is useless to strive for an "authentic" version',<sup>4</sup> and improper even to include them in modern critical editions.<sup>5</sup> Once it is realized that many implied inflections belonged to the domain of musical text, and that, unlike the attitude of early musicians, the modern view of notation requires that the complete text be written down, it becomes clear that the search for the correct realization (or, in some cases, the range of acceptable realizations) of implied inflections is the responsibility of the editor and that the results of this search should be spelled out in a critical edition.

### *Available accidental inflections*

GAMUT From the mid-13th until the end of the 16th century, musicians commonly thought of the total set of steps available to them, their gamut, as divided into two realms, those of 'true' or 'correct music' (*musica vera* or *recta*) on the one side, and 'feigned' or 'false music' (*musica ficta* or *falsa*) on the other.<sup>6</sup> The former was identified with the content of the so-called 'Guidonian' hand, a structure whose principal elements originated in the early 11th-century teaching of Guido of Arezzo but which acquired its fully developed form only in the late 13th century,<sup>7</sup> and the latter with all steps which could not be found within the hand.

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The 'hand' (*manus*) consisted of 10 'places' (*loca*) in which steps could be located. The places defined only the order of steps contained in them, but not the intervals between the steps. To identify the places one used 20 'letter names' (*claves*), in ascending order, the Greek letter G (*G* in modern letter notation), seven 'low' (*graves*) letter names from A to G (our *A* to *g*), seven 'high' (*acutae*) ones from a to g (our *a* to *g'*), and five 'highest' (*superacutae*) ones from aa to ee (our *a'* to *e''*).

Intervals between steps located in places were defined by means of the six 'syllables' (*voces*) of the 'hexachord' (*deductio*); in ascending order, *ut, re, mi, fa, sol, la*, which were located in consecutive places of the hand, and which formed an intervallic series consisting of a diatonic semitone surrounded on both sides by two consecutive whole tones. A step of the gamut was identified by means of a letter name and at least one syllable; by locating the syllable within the place, one defined the intervals between the step and the steps surrounding it within the range of the hexachord.

The hand contained seven hexachords beginning, respectively, on *G, c, f, g, c', f'* and *g'*, so that each of its 20 places contained one, two or three syllables. In order to define intervals beyond the range of a hexachord, one made a 'mutation' (*mutatio*) within a single place from a syllable belonging to one hexachord to a syllable belonging to another, interlocking one. Since it was assumed that *ut* of each hexachord had the same pitch as the syllable of the lower hexachord present in the same place, the gamut of *musica vera* consisted, in modern terms, of all the 'white-key' steps from *G* to *e''* plus *bb* and *bb'*.

In addition, from the late 15th century on, theorists were increasingly aware of the possibility of extending the range of the gamut,<sup>8</sup> and in the 16th century there were many who considered a step to be a part of *musica vera* as long as its syllable could be found among the syllables of the seven regular hexachords in another octave.<sup>9</sup> In modern terms, they extended the 'true' gamut to include 'white-key' steps beyond *G* and *e''* as well as *Bb*. This less restrictive view of *musica vera*, however, cannot be documented before the 16th century and even then it was not universally shared.

A step of *musica ficta* was produced when a syllable not belonging to any of the seven regular hexachords was located in any of the 20 places. In principle, any syllable could be located in any place. The resulting step could, but did not have to, differ in pitch from a *musica vera* step present in the same place. *Fa* and *mi* located in the same place differed by a chromatic semitone, just as they did in *musica vera* at *b* and *b'*.

While it was possible to have *fa* and *mi* in every place, it was, obviously, redundant to locate *fa* or *mi* more than once in a single place. This meant that the largest conceivable gamut contained 16 different pitches in an octave, in modern terms, the seven 'white-key' steps, plus five flattened 'black-key' steps (*Bb, Eb, Ab, Db, Gb*; roman capital letters will be used when the octave of the pitch is of no concern), plus four sharpened 'black-key' steps (*F#, C#, G#, D#*). The gamut was fully utilized by c1400 in such sources as the Chantilly codex and in Old Hall. In the early 15th century, Prosdocimus de Beldemandis noticed that *mi* was possible on the low *A* and, consequently, introduced one more step, *A#*.<sup>10</sup> The resulting gamut of 17 different pitches in an octave remained the largest possible

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gamut of musical practice through to the end of the Renaissance.<sup>11</sup> From the early 16th century, the possibility of going beyond these limits began to be explored in pieces of clearly experimental character (the earliest of which was most likely Adrian Willaert's celebrated *Quid non ebrietas*, written probably in 1519)<sup>12</sup> and discussed by theorists (initially stimulated by Willaert's puzzle).<sup>13</sup>

A consensus concerning the practical selection of steps considered to be most useful emerged by the mid-15th century.<sup>14</sup> It limited the gamut to 12 different pitches in an octave, in modern terms, seven 'white-key' steps, plus three flattened (B $\flat$ , E $\flat$ , A $\flat$ ) and two sharpened (F $\sharp$ , C $\sharp$ ) 'black-key' ones. The choice was explained by the desire to have *fa* in every place which in *musica vera* contained *mi*, and *mi* in every place which contained *fa*. It is easy to guess that this desire was dictated by one of the conventional uses of *musica ficta* steps, the prohibition of *mi*-against-*fa* discords (see section 3(iii) below); in order to be able always to avoid singing *mi* against *fa*, musicians had to have a gamut which contained *fa* in every place which already included *mi*, and the reverse.

Already in the late 15th century, however, some musicians chose G $\sharp$  instead of A $\flat$ ,<sup>15</sup> and by the second quarter of the 16th century, this became the more common choice.<sup>16</sup> It was dictated by another conventional use of *musica ficta* steps, the use of *mi*-steps as cadential leading notes (see section 3(iv) below); of these, G $\sharp$  was the third most commonly used. In short, since the late 15th century, the selection of most commonly employed steps included, in modern terms, three flats and three sharps.

**NOTATION** In notation, the places were represented by the alternating lines and spaces of the staff. One 'principal letter name' or 'principal clef' (*clavis principalis*) sufficed to identify all the places of the staff, of course. In *musica vera*, an ambiguity as to the desired pitch could arise at only two places, *b* and *b'*, since only these contained syllables differing in pitch; in them, *fa* was a chromatic semitone lower than *mi*. Because of this, two distinct forms of these letter names were used, the 'round b' (*b rotundum*, the ancestor of our flat;  $\flat$  will be used here) standing for *fa*, and the 'square b' (*b quadratum*, the ancestor of our natural; its most common graphic variant,  $\natural$  will be used here) standing for *mi*. In the early 14th century, one more sign, usually known as 'diesis' (*diesis*, the ancestor of our sharp; its common graphic variant,  $\sharp$ , will be used here), was introduced by Marchetto da Padova.<sup>17</sup> Until the end of the Renaissance it was normally considered to have exactly the same meaning as  $\natural$ .<sup>18</sup> *Mi* was assumed in the places of *b* and *b'*, so that when *fa* was desired, it had to be either implied or expressly indicated by an additional, 'less principal letter name' or 'less principal clef' (*clavis minus principalis*).<sup>19</sup>

In *musica ficta*, *fa* and *mi* could be located in every place, so that an ambiguity as to the desired pitch could arise anywhere. In any place, a pitch identical with that of a *musica vera* syllable found in the same place was assumed, so that when a pitch differing by a chromatic semitone was wanted, it had to be either implied or expressly indicated by means of the sign of *fa* or *mi*,  $\flat$  or  $\natural/\sharp$ , respectively. In principle, the signs did not have to affect the pitch at the place in which they were located, since they merely indicated the

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position of the diatonic semitone, *mi-fa*.<sup>20</sup> In practice, however, the signs almost always did flatten or sharpen the pitch in the place in which they were located by a chromatic semitone, just as they did at *b* and *b'*.<sup>21</sup> The only common exception was the location of *b* (or *b*/*#*) in a place which already contained *fa* (or *mi*), in which case the sign merely confirmed that *fa* (or *mi*) was wanted there and did not affect the pitch.<sup>22</sup>

A sign of *fa* or *mi* placed at the beginning of the staff was valid for the duration of the staff. If placed internally, it generally applied only to the note it accompanied.<sup>23</sup> Innumerable examples of signature accidentals an octave apart found in sources through the end of the Renaissance (and beyond) show that such signs were valid in only one octave.

### *Conventional uses of accidental inflections*

**SIGNATURES** The normal use of the 'less principal clefs' at the beginning of the staff was to transpose a melody without changing its mode, that is to say, it was identical with that of a modern key signature.<sup>24</sup> A signature made a modal transposition possible, since it transposed a system of hexachords. Until the late 15th century this was probably the regular system of seven hexachords, but in the 16th century the system which was transposed was normally seen as consisting of interlocking hexachords alternately a fifth and a fourth apart, that is, hexachords on C and G.<sup>25</sup> In either case, the transposed system of hexachords was considered to represent *musica ficta*,<sup>26</sup> and consequently there is no reason to believe that *E $\flat$*  under the one-flat signature, or *A $\flat$*  under the two-flat signature, was ever thought of as belonging to *musica vera*.<sup>27</sup>

The use of different signatures in different voices, a common practice until the early 16th century, continues to puzzle musicologists.<sup>28</sup> Relevant theoretical evidence is unfortunately very scarce, but it is unanimous in suggesting that the function of such differing signatures was to provide an automatic insurance against prohibited vertical imperfect fifths (for this prohibition, see section 3(iii) below).<sup>29</sup> Indeed, it is plausible to suppose that differences between signatures helped to fulfil those conventional functions of internal accidental inflections which involved more than one voice. Since voices were notated separately (either in separate areas of an opening in a choirbook or in separate partbooks) rather than vertically aligned in score, the accidentals that musicians were most likely to miss were the ones needed because of vertical relations arising between voices. One less flat in the signature of an upper voice, or one more flat in the signature of a lower voice, would be used when the fear of a vertical imperfect fifth was greater than the fear of a vertical imperfect octave.<sup>30</sup> Note that since cadences also involve more than one voice (see section 3(iv) below), the central part of Edward E. Lowinsky's hypothesis,<sup>31</sup> the claim that the lack of a flat in the signature of an upper voice automatically provided leading notes at some cadences, is also plausible and can supplement the explanation presented above. But it should be pointed out that there is no theoretical evidence to support Lowinsky's hypothesis and that the need for a leading note was more easily discovered from reading a single part, since cadences involved characteristic melodic-rhythmic formulae.

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In order to be able to reconcile our explanation of the function of differing signatures with the knowledge that the function of a signature was to produce a modal transposition, we must realize that the use of differing signatures flourished in the period of 'successive' composition in which complete parts fulfilling different functions were successively added to the voice which defined the mode of the polyphonic whole (usually, but perhaps not always, the tenor)<sup>32</sup> and gradually disappeared with the advent of 'simultaneous' composition which minimized the functional differentiation of individual parts and encouraged musicians to employ mainly the species of fifth and fourth of a single modal pair in all parts. This suggests that, in a work using different signatures, the signature of one voice only was relevant to the modal definition of the whole, while 'conflicting' signatures of other voices automatically provided the inflections required by contrapuntal rules and were relevant at most to the modal definition of individual parts.

THE PROHIBITION OF MELODIC TRITONE, DIMINISHED FIFTH, IMPERFECT OCTAVE AND CHROMATIC SEMITONE The main use of accidental inflections in purely melodic contexts was to avoid the tritone. From the time of *Ars Antiqua* polyphony through to the end of the Renaissance, the tritone prohibition was discussed by theorists in remarkably similar terms and it is therefore unlikely that the general way of handling the problem evolved significantly, or differed much, from place to place.<sup>33</sup> The diminished fifth began to be commonly prohibited from the late 15th century on.<sup>34</sup> It is uncertain, but seems likely, that the prohibition was followed by earlier musicians as well, and that theorists had omitted to mention it because they felt that discussions of the tritone covered the whole problem adequately. The imperfect octave was regularly prohibited in the 16th century<sup>35</sup> and again we do not know whether the prohibition was practised earlier, though probably it was. The prohibition of the chromatic semitone, on the other hand, is theoretically documented from at least the early 14th century on.<sup>36</sup> What all these prohibitions have in common is that they involve *mi* and *fa* located in places distant by a fourth, fifth, octave or unison. This similarity, plus the fact that exactly the same relations were prohibited when they occurred vertically, is the main reason for thinking that the prohibitions of diminished fifth and imperfect octave were in force long before theorists bothered to discuss them.

The tritone, diminished fifth, imperfect octave and chromatic semitone were prohibited regardless of whether they were ascending or descending, direct or indirect. But the prohibition had several exceptions:

1. A prohibited progression did not offend if anything (a rest, a cadence) which produced a sense of punctuation in the flow of the melody intervened between the notes forming the progression. It is obvious that differences of opinion over what constituted a sufficiently strong musical punctuation could arise. In this, as in all other cases of this sort, we shall have to study the practice followed in a given repertory on the basis of source accidentals and we shall have to remember that some contexts may have admitted alternative solutions.

2. An indirect prohibited progression lost its force if it was filled with many notes. Again, it is clear that musicians could occasionally disagree over how many notes were enough.

3. A pre-diatonic set-down if it applied only to the prohibited notes. The prohibition was absolute.<sup>37</sup> while general contrapuntal rules were acceptable notes which musical punctuation resolved its resolution.

In describing the system, the prohibition was without prejudice. By the early 16th century the rule according to which notes above *la*, were to remember the prohibition. An examination of the practice is preferable.

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3. A prohibited progression was tolerated when it was resolved by a diatonic semitone, up if its last note was *mi* (for instance, *f* . . . *b-c'*), and down if it was *fa* (*b* . . . *f-e*). Many theorists thought that this exception applied only to indirect progressions, but some made it even with direct ones. The prohibition of a direct imperfect octave, however, seems to have been absolute.<sup>37</sup> A direct chromatic semitone (such as *f* to *f*♯), on the other hand, while generally prohibited, could be tolerated if its use was justified by contrapuntal rules and if it was properly resolved to fill the whole tone.<sup>38</sup> An acceptable resolution of a prohibited progression could be delayed by a few notes which, again, might lead to disagreements. On the other hand, a musical punctuation intervening between the last note of the progression and its resolution cancelled the effect of the resolution.

In describing an ascent by step to *b* but not further in the untransposed system, theorists often explained that if one wanted to proceed beyond *a-la* without producing the tritone, one had to make the following step into *fa*.<sup>39</sup> By the early 16th century some musicians began mechanically to follow the rule according to which one always made *fa* when ascending only one step above *la*, whether or not there was *f* before or after,<sup>40</sup> while others continued to remember that one did it only when there was a tritone to be avoided.<sup>41</sup> An examination of relevant source accidentals will show which solution is preferable for a given repertory.

Theoretical evidence is practically unanimous in indicating that one normally avoided an offending progression by changing *mi* into *fa* and not the reverse, that is, using a flat rather than sharp. From comments of those few theorists who addressed the question of what was done when an internal flat introduced to correct a tritone produced a diminished fifth in turn, we may infer that the idea that one internally introduced *fa* could lead to another at a place distant by a fourth or fifth (for instance, *f* . . . *bb* . . . *eb*) in a kind of a 'chain reaction' was alien to them, since they recommended in such cases that the originally offending tritone be left uncorrected.<sup>42</sup> Thus it is unlikely that normal practice made use of implied flats applied to a chain of descending fifths or ascending fourths, though the existence of such 'chain reactions' can be demonstrated in two early 16th-century experimental pieces.<sup>43</sup>

Theorists consistently point out that the tritone was avoided particularly often in the F modes (tritus) (since it arose there in relation with the final), and fairly often in the D modes (protus). On the other hand, B♭ was uncommon in the E modes (deuterus) (because it produced a diminished fifth with the final there) and particularly rare in the G modes (tetrardus) (where, unlike in other modes, a consistent use of B♭ destroyed the identity of the mode). In addition, it should be remembered that at least since the early 14th century a basic feature of contrapuntal theory and practice was the differentiation of the simple note-against-note consonant counterpoint and the embellishing diminished one, so that it was always possible to reduce a composition to its underlying simple counterpoint. These facts suggest that musicians made distinctions as to the relative structural importance of notes in their music, distinctions based on contrapuntal and, once modal concepts began to be applied to polyphony, also on modal considerations. It is possible that distinctions of this sort were taken into account when one

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decided whether a given melodic progression had to be corrected or not. For instance, there seems to be no theoretical evidence concerning how tritones embedded in perfect fifths, such as *c'-b-...-f* or *e-f-...-b*, were handled, but it seems plausible that the treatment of these and similar progressions in which the flattening of *b* produced a conflict with *e* depended on whether the structurally important notes formed the tritone, in which case the tritone would have to be corrected, or the fifth, in which case it could be left alone. More generally, it seems plausible that the more important structurally the notes forming a forbidden progression the more offensive it was found, and that a resolution by means of a note at least equally important to the offending one was more satisfactory than a resolution by means of a structurally less weighty note. Needless to say, instinctive or conscious decisions based on an evaluation of relative structural importance of notes would have to lead occasionally to disagreements.

**THE PROHIBITION OF MI-AGAINST-FA DISCORDS** From the moment the modern classification of consonances and dissonances emerged c1300 until the end of the Renaissance, a common rule of counterpoint prohibited vertical, nonharmonic relations between *mi* and *fa* located in places a perfect consonance apart.<sup>44</sup> Since most treatises presented no more than elementary instruction in simple two-part counterpoint from which the fourth was excluded as a dissonance, the rule most often prohibited expressly *mi* against *fa* on the fifth and octave (and, of course, their octave equivalents) only, that is, it prohibited imperfect fifths and octaves. But since in simple counterpoint for more than two parts the fourth could be used as a consonance provided it had a fifth or third below, it is obvious that, when it was meant to be so used, *mi* against *fa* had to be avoided also on the fourth.<sup>45</sup> The use of accidental inflections to correct all such nonharmonic relations was often said to be 'because of necessity' (*causa necessitatis*).<sup>46</sup>

While theorists inform us of no exceptions to the prohibition of the imperfect octave, the prohibition of the imperfect fifth and fourth had some exceptions:

1. From the late 15th century on, we regularly learn that a vertical nonharmonic relation was tolerated even in simple counterpoint when it was followed by a consonance with at least one, and preferably both, notes forming the relation properly resolved, that is to say, with *mi* going a diatonic semitone up and/or *fa* a diatonic semitone down.<sup>47</sup> The most common instance of the exception was a diminished fifth resolving to a third. The resolution could be delayed by structurally less important notes belonging to diminished counterpoint or by a short rest.<sup>48</sup> The notes of resolution could even be exchanged between the two parts.<sup>49</sup> It is clear that disagreements could occasionally arise as to whether a given relation was properly resolved or not. It is interesting to note that a properly resolved nonharmonic fifth could be preceded or even followed by a perfect one without this being taken as an offence against the prohibition of parallel perfect consonances.<sup>50</sup> The exception allowing properly resolved *mi*-against-*fa* discords is not documented in theoretical literature before the late 15th century, but since the general tendency in the development of counterpoint was toward the increasing restrictions on the use of dissonances, it is unlikely that the *mi*-

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against-*fa* prohibition would be followed unconditionally at first and liberalized later. Hence it seems probable that in practice the exception was attached to the prohibition from the beginning.

2. From a mid-16th-century theorist who claimed to describe the teaching of Josquin Desprez we learn that a nonharmonic vertical relation was allowed as a passing discord of short duration (the maximum duration of any dissonant passing note) even if this was not properly resolved.<sup>51</sup> Once again, since earlier practice was more lenient rather than stricter in its handling of dissonances, it seems likely that this exception was followed in practice from the beginning of the prohibition.

Cross relations involving imperfect octaves, fifths and fourths were not discussed in any depth before Zarlino, whose treatment of the problem gives the impression that he was attempting to reform, rather than to describe, current practice.<sup>52</sup> It is possible, but by no means certain, that by the mid-16th century musicians tended to avoid the imperfect octave cross relations. As for the cross relations involving the imperfect fifth and fourth, Zarlino's concern with these seems to reflect the teaching of Willaert, but not the common practice.<sup>53</sup> It may be, however, that the prestige of Zarlino's contrapuntal theory spread this concern more widely among the followers of the 'first practice' in the late 16th century. Recent researches based on practical evidence demonstrated widespread tolerance of nonharmonic cross relations, including the cross relation of the imperfect octave, in late 15th- and 16th-century music.<sup>54</sup> We need more research of this kind to determine when and where musicians began to avoid nonharmonic cross relations, if they ever did, and whether the treatment of the imperfect octave differed from that accorded to the imperfect fifth and fourth.

Theoretical evidence indicates that, when confronted by the necessity of correcting a vertical nonharmonic relation by means of an accidental inflection, musicians did not normally think in terms of which voice to inflect (lower or upper, tenor or counterpoint written against it),<sup>55</sup> but rather in terms of whether to use *fa* or *mi* (flat or sharp). Since the same relations occurring melodically were normally corrected by means of flats, it is not surprising that, from the 1470s on, it seems to have been self-evident to theorists that the usual way to correct a *mi*-against-*fa* discord was to change the *mi* into *fa*.<sup>56</sup> Theorists of the 14th and early 15th centuries, however, appear to have had no clear preference for either *fa* or *mi* in such cases.<sup>57</sup> An examination of source accidentals will be necessary to determine whether the preference for flat solutions in practice antedated the 1470s.

The question of what one did when a correction of a melodic relation produced an undesirable vertical one or the reverse was discussed by Tinctoris who made it clear that one corrected in such cases the vertical nonharmonic relation and not the melodic one.<sup>58</sup> It is particularly noteworthy that it did not even occur to the theorist that one could correct both relations by means of a 'chain reaction' in which the introduction of one accidental would lead to the introduction of another at a place a fourth or fifth apart. We can be confident that Tinctoris described the normal practice in this case and that the practice was followed not only in the late 15th but also in the 16th century, since it was independently confirmed by Giovanni del Lago in 1538.<sup>59</sup> The question of whether vertical considerations took

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precedence over melodic ones also before the late 15th century requires further investigation.

**CADENCES** From the moment the modern classification of consonances and dissonances emerged c1300 through to the end of the Renaissance theorists universally stipulated that in a progression from an imperfect to a perfect consonance one part should proceed by a diatonic semitone and that one of the steps forming the imperfect consonance might be accidentally inflected if this was necessary to produce the semitone progression.<sup>60</sup> They also made it clear that the progression provided a sense of closure, or punctuation, that is, that it functioned as a cadence. The use of accidental inflections in such contexts was occasionally said to be 'because of beauty' (*causa pulchritudinis*).<sup>61</sup> It is immediately apparent that a consistent application of accidental inflections to all progressions from imperfect to perfect consonances would lead to results which would be unacceptable from the standpoint of rules governing correct usage in early polyphony. Thus we have to be able to distinguish those imperfect-to-perfect progressions which were meant to serve as cadences from those which were not, that is, we have to find additional criteria allowing musicians to recognize a cadence.

The following additional criteria were regularly mentioned by theorists from the late 15th century on:<sup>62</sup>

1. A cadence signifies a certain degree of closure of the whole musical discourse or of its part.

2. It is analogous to a punctuation sign marking the articulation of a verbal text into such units as clauses, sentences and paragraphs, and it may reflect such articulation of the text.

3. The octave (or its equivalent) is an indispensable component of the final harmony in a cadence. In simple counterpoint, a cadence consists of three consecutive harmonies, with one of the two parts which end on the octave following the melodic formula 8-7-8 (= 1-7-1; the consecutive Arabic numerals signify the consecutive steps above the final, 1, of the cadence) and the counterpoint against it involving 1 (or 8) as the final step, 2 or 5 as the penultimate step, and any step which produces a consonance against 8 (or 1) as the antepenultimate step. In diminished counterpoint, the penultimate imperfect consonance is preceded by a dissonant suspension and the cadence may, of course, be further embellished.

4. The final harmony should fall at the beginning of a mensuration unit which under the 'ordinary measure' (*misura commune*:  $\text{C}$ ) of the early 16th century seems to have been no smaller than a semibreve. Theorists do not explain what was, for each of the time signatures used, the smallest mensuration unit at the beginning of which it was possible to place the final harmony of a cadence and the matter requires further investigation.

5. A cadence may be 'interrupted', in which case it consists of only the first two harmonies of the regular cadence, with the second one placed in a metrically strong position reserved normally for the final harmony of the regular cadence. A cadence may also be 'evaded', in which case both structural voices behave normally for the first two harmonies, but go (both, or just one of them) to unexpected steps for the final harmony. In either case, the leading note should be inflected if this were necessary

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Unfortunately, cadences began to be described in detail only from the late 15th century on, but since cadences belong to the most conservative stylistic features it may well be that the criteria listed above were in operation long before theorists began to mention them. Before a full history of the cadence is written we have to study the unmistakable (final) cadences in a given repertory, determine whether our criteria apply and whether additional criteria may be derived from such a study, and use the applicable criteria when trying to distinguish the cadential from the non-cadential imperfect-to-perfect progressions within the repertory.

We also have to remember that cadences reflected various degrees of punctuation of the text and were themselves of various strength, perfection or finality, from the most regular and perfect cadential progressions ending on long notes, in metrically strong position, on the final of the mode, to a variety of interrupted and evaded cadences. This suggests that the borderline between cadential and non-cadential imperfect-to-perfect progressions may be somewhat blurred. A progression may exhibit some, but not all, of the characteristic features of a cadence. While some progressions were certainly treated as cadences and others certainly not, there was a grey area in between in which a decision had to be made as to whether a given progression should be treated as a cadence or not and in which alternative solutions might have been acceptable. From the 1520s on we learn that if the final harmony of a cadence contain 3, then the third (or its octave equivalent) between 1 and 3 should be major.<sup>63</sup>

The only context in which musicians may have been confronted with the question of how to inflect a cadential progression, specifically whether to use sharp or flat, was the penultimate cadential harmony containing only 7 and 2, and optionally 4, when 1 had naturally a whole tone below and above, for instance, the penultimate harmony in a cadential progression of  $d'-c'-d'$  in the cantus moving against  $f-e-d$  in the tenor (and, optionally,  $a-g-a$  in the contratenor) when the voices had no signature accidentals. Since the only indispensable steps in such a harmony were 7 and 2 ( $c'$  and  $e$  in our example), the main decision must have concerned these two steps. Doubling a step in another voice might well have been an indication that it was not meant to be inflected, since an inflection implied a continuation of the melodic movement ( $mi$  going to  $fa$ , or  $fa$  to  $mi$ ), while the prohibition of parallel perfect consonances prevented the proper resolution of one of the inflected notes. Assuming an entirely neutral melodic and vertical context for 7 and 2, that is, a context allowing either solution, theoretical evidence leaves no doubt that the preferred choice for cadences on D and G in the untransposed system was to sharpen 7.<sup>64</sup> The choice was less obvious, however, in cadences on A when the voice which had 2 had no flats in the signature (and in corresponding cadences on D with one flat in the signature, and on G with two flats in the signature).<sup>65</sup>

While it is clear that, at least since the early 15th century, both solutions were acceptable for these cadences,<sup>66</sup> theorists do not explain whether any one solution was preferred in a specific context and, if so, how one made the choice, and practical evidence has not yet been examined with this question

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in mind. One late 15th-century theorist, Ramos de Pareia, suggests that the disagreement as to which leading note to use in cadences on A resulted from conflicting modal interpretations of such cadences as representing either the irregularly placed protus, in which case the sharp leading note proper to the regular protus on D would be used, or the transposed deuterus, in which case one chose the flat leading note proper to the untransposed deuterus on E.<sup>67</sup> Hence, it is possible that a well-trained musician chose the leading note for a cadence on A depending on the modal context of the cadence. In a piece the tenor of which was notated without a signature and had the final on A, the sharp leading note would be used since A cadences would be understood to represent the protus. But in a piece conceived in another untransposed mode, the treatment of a cadence on A may have depended on whether the cadence was understood to represent a strong shift away from the main tonal centre of the piece, in which case one would choose the sharp leading note forcefully conveying the shift to the protus on A, or just a momentary emphasis on a degree different from the final, in which case one might prefer the weaker flat leading note, especially if the piece was in the tritus or protus in which B $\flat$  was common anyway and, consequently, would not unduly disturb the fundamental mode. The choice would have involved musical decisions difficult, though not impossible, to articulate in the theoretical language of the period, and hence ones that are most likely to have been made instinctively, which would account for conflicting decisions in this area.

If the penultimate cadential harmony contained 4 (in addition to the structural 7 and 2) which went on to 5, and if the 7 had been sharpened, the 4 had to be sharpened as well, provided the context allowed it (that is, most likely, provided the 4 had not been doubled), because of the secondary cadential progression of the major third going to the fifth. That in a cadential progression from a vertical third to a vertical fifth the third should be major, was asserted by theorists from the early 14th through to the late 16th century.<sup>68</sup> Thus we shall have to examine practical evidence to find out whether the secondary leading note (the sharp 4) ever went out of fashion (which is likely, since 16th-century lute intabulations, for instance, seem almost never to use them)<sup>69</sup> and, if so, when and where precisely. A clear indication that a composer, school or generation wanted to avoid the sharpening of the penultimate 4 would be that the 4 regularly goes not to 5 but elsewhere (to 3 or 1), or that it is shunned altogether in favour of 5.

**CANON AND IMITATION** In addition to the increasingly ubiquitous technique of imitation, early vocal polyphony developed a family of special techniques involving the use of the same *complete* melody more than once in a composition, so that in principle the melody might have been, but in reality did not have to be, notated just once, its repetitions and transformations being directed by a written 'rule' (*canon*). The matter certainly requires further investigation; so far, however, no evidence has been found that imitative or canonic voices were given special treatment when it came to adding inflections because of the *mi*-against-*fa* prohibition or in order to produce cadential leading notes. But both imitative and canonic techniques raise the question of whether accidental inflections were used when the melody was imitated or repeated at a different pitch in order to preserve its

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original intervals. (That the preservation of exact sizes of original intervals when the melody was imitated or repeated at the same pitch or at the octave was desirable should probably go without saying and there is mid-16th-century evidence for it,<sup>70</sup> but it is unlikely that this desire affected the normal ways in which *mi*-against-*fa* and cadential inflections were made.) Zarlino's 1558 discussion of canon and imitation,<sup>71</sup> by far the most detailed early treatment of these techniques, allows us to conclude that only canons (but almost certainly not imitations) at fourth and fifth above and below were normally (but not always) assumed to reproduce the intervals of their guides exactly, which means that only such canons might have called for accidental inflections in their consequents in order to preserve the exact intervals of their guides. Since no earlier theorist approaches the comprehensiveness of Zarlino's discussion, it is difficult to know for sure how long before his time the above conclusion was valid. But the conclusion is so simple and agrees so well with other aspects of the medieval and Renaissance theory (in particular, with the location of the seven identical hexachords of the regular gamut at places distant by the fourth and fifth), that it can provide a working hypothesis for further study of the problem.

#### *Conventional and unconventional written accidental inflections*

Written accidental inflections found in practical sources of early vocal polyphony may be divided into two classes. Some accidentals may have been written down by the composer or by the editor of a given version of the work (I shall refer to both as the 'author' of a given version), or they may have been implied by the author and written down by someone else: a scribe, printer or performer. Other accidentals had to be written down by the author, because there was no possibility of implying them. The class of potentially non-authorial accidentals contains all internal accidentals used for conventional reasons discussed in sections 3(ii)–(v) above and signature accidentals 'conflicting' with the key signature of the mode-defining voice.<sup>72</sup> The class of certainly authorial accidentals comprises all internal accidentals used for unconventional reasons, whether structural or expressive, and the key signature of the mode-defining voice. (Thus, for instance, the flats which endow the celebrated 'miserere' phrase in the second 'Agnus Dei' of Dufay's *Ave regina caelorum* Mass with much of its expressive power would not be supplied by singers had they not been notated, since they serve no known conventional function.)<sup>73</sup>

The division of all source accidentals into two classes proposed here should prove useful to editors and performers. First, a study of the functions of 'conventional' source accidentals in a given repertory will allow them to find out how those situations about which we know that they may have admitted alternative solutions were handled in this particular repertory.<sup>74</sup> Second, the division may help them to distinguish and reconstruct the complete texts of all versions of the work, both authentic (that is, representing the composer's wishes) and inauthentic ones, and, for each version, to reveal and evaluate the relative authority and plausibility of all the alternative realizations implied by the notated text.<sup>75</sup> If the sources differ to a significant degree in 'unconventional' accidentals, they must transmit different versions of the

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work, since differences in 'unconventional' accidentals could not be obliterated in performance.<sup>76</sup> And, within each version of the work, 'unconventional' source accidentals possess a much greater degree of authority than the 'conventional' ones which may have been added in the process of transmission.

## Notes

<sup>1</sup> 'Virtualiter licet semper non signentur', *The Berkeley Manuscript*, ed. and trans. O. B. Ellsworth (Lincoln, Nebraska and London, 1984), 44f. For other representative statements, see for example Johannes Legrense, *Ritus canendi vetustissimus et novus*, in *CS*, iv, 360f; Johannes Tinctoris, *Liber de natura et proprietate tonorum*, in *Opera theoretica*, ed. A. Seay, CSM, xxii/1 (1975), 74; Pietro Aaron, *Toscanello in musica* (Venice, 1539/R1971), bk2, chap.20, and 'Aggiunta', through to sig.Iiir; Gioseffo Zarlino, *Le istituzioni harmoniche* (Venice, 1558/R1965), 222, 237. Aaron's 1529 'Aggiunta' to *Toscanello* contains the fullest known discussion of the problem of implied accidentals extant. For a more extended presentation and discussion, see K. Berger, *Musica ficta: Theories of Accidental Inflections in Vocal Polyphony from Marchetto da Padova to Gioseffo Zarlino* (Cambridge, 1987).

<sup>2</sup> L. Lockwood, 'A Dispute on Accidentals in Sixteenth-century Rome', *AnMc*, no.2 (1965), 24-40.

<sup>3</sup> Aaron's invaluable 'Aggiunta' to *Toscanello* (see n.1 above) could not be construed in any other terms.

<sup>4</sup> C. Dahlhaus, 'Tonsystem und Kontrapunkt um 1500', *Jb des Staatlichen Instituts für Musikforschung* (1969), 14. Dahlhaus's paper represents the most radical attempt to prove that until the second third of the 16th century accidental inflections belonged largely to what I have called here the domain of performance. It is based on the claim that since the theorists of the period formulated their rules using such concepts as 'perfect' or 'imperfect consonance' therefore composers thought in terms of these abstract interval classes and hence were indifferent toward the specific sizes of, say, the fifths that they used. The most fundamental problem with this theory is that thinking in terms of interval classes of this kind does not make one indifferent to the specific sizes of intervals: the concept of 'perfect consonance', when applied to the interval of fifth, suffices to specify the size of this fifth most precisely.

<sup>5</sup> A. Mendel, 'The Purposes and Desirable Characteristics of Text-critical Editions', *Modern Musical Scholarship*, ed. E. Olleson (Stocksfield, 1980), 14-27.

<sup>6</sup> For this distinction see M. Bent, 'Musica Recta and Musica Ficta', *MD*, xxvi (1972), 73-100.

<sup>7</sup> For the origin, development and function of the concepts in terms of which early musicians thought about their gamut and of the signs they used to notate it, see K. Berger, 'The Hand and the Art of Memory', *MD*, xxxv (1981), 87-120, with further literature to be found there.

<sup>8</sup> See for example Bartolomeo Ramos de Parcia, *Musica practica*, ed. J. Wolf (Leipzig, 1901/R1968), 12. By 1533, Stephano Vanneo presented a system of places extending a full octave below and above the customary one, *Recanetum de musica aurea* (Rome, 1533/R1969), ff.10r-11v.

<sup>9</sup> See for example Nicolaus Wollick, *Enchiridion musicæ* (Paris, 1512), sig.b.iiir; Johannes Cochlaeus, *Tetrachordum musices* (Nuremberg, 1514), sigs.Cr-Cv; Vanneo, *Recanetum*, f.11r-11v; Heinrich Glarean, *Dodecachordon* (Basle, 1547/R1969), 5.

<sup>10</sup> Prosdocimus de Beldemandis, *Libellus monochordi*, in *CS*, iii, 248-58.

<sup>11</sup> For a view that the gamut of vocal polyphony had no limits, see M. Bent, 'Diatonic Ficta', *EMH*, iv (1984), 1-50. (I would like to thank Professor Bent for kindly sending me the proofs of her paper before publication.) Bent's hypothesis is based essentially on the idea that, for early musicians, the definition of any step was independent not only of an absolute pitch standard (which is correct), but also of a relative standard established at the beginning of a composition's performance by the singers, so that, for instance, if a melody started with *G* and ended with what for us is *Gb*, early musicians would not think of the two pitches as being different. This, however, neglects the fact that for an early musician a step was identified not by a letter alone, but by a letter combined with a syllable. He would assign the last *G* a syllable from a different hexachord than that of the first *G*, and his choice of the syllable would depend on the syllables and mutations taken since the melody started. This shows that his definition of a step did depend on a standard established at the beginning of the performance of a work.

<sup>12</sup> The best examined', concerning Letters', in picce of the *Fortuna*: an 519; xliii (1 Lowinsky, *Tonos*', in H. M. Brov (*Florence, B*

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<sup>14</sup> See for c (1964), 46f Pareia, *Mu musica* (Wit

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<sup>12</sup> The best discussion of the work is E. E. Lowinsky, 'Willaert's Chromatic "Duo" Re-examined', *TYNM*, xviii (1956), 1–36. Relevant to the question of dating are the discoveries concerning Willaert's early career in L. Lockwood, 'Josquin at Ferrara: New Documents and Letters', in *Josquin des Prez: New York 1971*, 118ff. The second unmistakably experimental piece of the first half of the 16th century has been explored in Lowinsky, 'Matthaeus Greiter's *Fortuna*: an Experiment in Chromaticism and in Musical Iconography', *MQ*, xlii (1956), 500–519; xliii (1957), 68–85. For other, more debatable, candidates for 'experimental' status, see Lowinsky, 'Music in Titian's *Bacchanal of the Andrians*: Origin and History of the *Canon per Tonos*', in *Titian: his World and his Legacy*, ed. D. Rosand (New York, 1982), 191–282, and H. M. Brown, 'Introduction', *A Florentine Chansonnier from the Time of Lorenzo the Magnificent (Florence, Biblioteca Nazionale Centrale MS Banco Rari 229)*, *MRM*, vii/1 (1983), 16–22.

<sup>13</sup> Apart from specific references to Willaert's puzzle, the earliest important discussion concerned the problem of whether one can really flatten C or F and sharpen B or E which was a subject of the correspondence between Giovanni Spataro, Pietro Aaron and Giovanni del Lago in 1533, in *I-Rvat* lat.5318, ff.47r–53v, 116r–29v, 165r–6r, 234v.

<sup>14</sup> See for example Anonymous, [*Libellus*] *Ex Codice Vaticano Lat. 5129*, ed. A. Seay, CSM, ix (1964), 46f; Anonymous XI, *Tractatus de musica plana et mensurabili*, in *CS*, iii, 426–9; Ramos de Pareia, *Musica practica*, 29ff, 33, 40; Vanneo, *Recanetum*, ff.43r–4r; Hermann Finck, *Practica musica* (Wittenberg, 1556/R1970), sigs.Bijj–Bijjv.

<sup>15</sup> See Ramos de Pareia, *Musica practica*, 101f.

<sup>16</sup> See for example Aaron, *Toscanello*, bk2, chap.40; Aaron, *Lucidario in musica* (Venice, 1545/R1969), ff.35v–6v; Zarlino, *Le istituzioni harmoniche*, 138f.

<sup>17</sup> Marchetto needed a new sign, since he supplemented the normal division of the whole tone into the minor (or diatonic) and major (or chromatic) semitones with another division into a 'diesis' which was smaller than the minor semitone and a semitone which was larger than the major one. The sign of diesis marked the interval of diesis between a lower leading note and its resolution. The sign was subsequently adopted, and used indistinguishably from  $\flat$ , also by those who did not follow Marchetto's ideas on the division of the whole tone. For Marchetto's division of the whole tone, the invention of the diesis sign and the historical influence of these developments, see especially M. L. Martinez-Göllner, 'Marchettus of Padua and Chromaticism', in *L'ars nova italiana del trecento II: Certaldo 1969*, 187–202; J. W. Herlinger, 'Fractional Divisions of the Whole Tone', *MTS*, iii (1981), 74–83; Herlinger, 'Marchetto's Division of the Whole Tone', *JAMS*, xxxiv (1981), 193–216.

<sup>18</sup> See for example Ugolino of Orvieto, *Declaratio musicae disciplinae*, ed. A. Seay, CSM, vii/3 (1962), 243; Ramos de Pareia, *Musica practica*, 29; Heinrich Faber, *Ad musicam practicam introductio* (Nuremberg, 1550), pt.i, chaps.1 and 3; Zarlino, *Le istituzioni harmoniche*, 170. In the late 15th century, John Hothby wanted to distinguish the functions of  $\flat$  and  $\sharp$  and claimed that the former should be used as the sign of *mi* only in the places of  $\flat$  and its octaves, the latter – at all the other places. He was followed in the early 16th century by Giovanni Spataro and Pietro Aaron. This was the first step in the transition from the medieval to modern understanding of these three signs. See Hothby, *La Caliopea legale* in E. de Coussemaker, *Histoire de l'harmonie au moyen âge* (Paris, 1852), 297ff; Spataro, letter to Aaron, Bologna, 27 November 1531, *I-Rvat* lat.5318, ff.228v–9r; Aaron, *Lucidario in musica*, bk1, oppenione 10 and ff.3v–4r.

<sup>19</sup> See for example Jacques de Liège, *Speculum musicae*, ed. R. Bragard, CSM, iii/6 (1973), 138, and Glarcan, *Dodecachordon*, 13. For the terminology, see F. Reckow, 'Clavis', in *HMT*.

<sup>20</sup> Thus Ugolino of Orvieto (*Declaratio*, bk2, p.45, cx.121) indicated what for us is *f* by preceding *f* with a  $\flat$  located in the place of *g*.

<sup>21</sup> For unambiguous statements to that effect, see for example Petrus frater dictus Palma oiosa, *Compendium de discantu mensurabili*, in J. Wolf, 'Ein Beitrag zur Diskantlehre des 14. Jahrhunderts', *SIMG*, xv (1913–14), 515; Prosdocius de Beldemandis, *Contrapunctus*, ed. J. W. Herlinger (Lincoln, Nebraska, and London, 1984), 76; Ramos de Pareia, *Musica practica*, 29; Aaron, *Lucidario in musica*, f.38r–38v.

<sup>22</sup> An example is the frequent use of a redundant flat at *f'* to indicate that the place lies beyond the regular system of 20 places. See E. E. Lowinsky, 'The Function of Conflicting Signatures in Early Polyphonic Music', *MQ*, xxxi (1945), 254ff. Another type of example is the common use of a redundant flat (or sharp) to ensure that a note it accompanies is not sharpened (or flattened) by the singers. A few examples of this type may be found among the cases of 'cautionary signs' collected in D. Harrán, 'New Evidence for Musica Ficta: the Cautionary Sign', *JAMS*, xxix (1976), 77–98. We must distinguish, however, between genuine 'cautionary signs' (the signs of *fa* – or *mi* – used to ensure that the notes they accompany are not made into *mi* – or *fa*) and

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Harrán's main type of 'cautionary sign' (the sign of *mi* used to indicate that *fa* is wanted there). The former do indeed occur; the latter would require that the same sign be used in two opposed meanings, a bizarre practice for which I see no convincing evidence. See also Harrán, 'More Evidence for Cautionary Signs', *JAMS*, xxxi (1978), 490–94 as well as comments in *JAMS*, xxxi (1978), 385–95; xxxii (1979), 364–7.

<sup>23</sup> See for example Prosdocimus, *Contrapunctus*, 78f; Ramos de Pareia, *Musica practica*, 39; Giovanni Maria Lanfranco, *Scintille di musica* (Brescia, 1533/R1970), 18; Martin Agricola, *Rudimenta musices* (Wittenberg, 1539/R1966), chap.2; Sebald Heyden, *De arte canendi, ac vero signorum in cantibus usu* (Nuremberg, 1540/R1969), 23f. Tinctoris's claim that an internal sign of *fa* or *mi* retains its force so long as the melody remains within the range of the hexachord around the *fa* or *mi* (*Liber de natura*, 74) probably represents an unsuccessful attempt to reform the current practice, since it was not repeated by other theorists.

<sup>24</sup> See for example Marchetto da Padova, *Lucidarium in arte musicae planae*, in J. W. Herlinger, *The Lucidarium of Marchetto of Padua: a Critical Edition, Translation, and Commentary* (diss., U. of Chicago, 1978), 622; Tinctoris, *Liber de natura*, 98–103; Pietro Aaron, *Trattato della natura et cognitione di tutti gli tuoni di canto figurato non da altrui piu scritti* (Venice, 1525/R1969), chaps.4–7; Glarean, *Dodecachordon*, 31, 101f.

<sup>25</sup> The notation without signature was now said to represent the 'hard hand' (*manus dura*), that with one flat in the signature – the 'soft hand' (*manus mollis*) – and that with more than one flat in the signature – the 'feigned hand' (*manus ficta*; the terms 'song' (*cantus*) or 'scale' (*scala*) could be used instead of 'hand'). See, for example, Andreas Ornithoparchus, *Musice active micrologus* (Leipzig, 1517/R1977), sigs. Biiir–Biiiv.

<sup>26</sup> In the early 15th century, Ugolino referred to gamuts consisting of the regular system of seven hexachords and the same system transposed as combining steps of *musica vera* and *ficta* (*Declaratio*, bk2, pp.48ff) which shows that he considered a transposed system to represent *musica ficta*, not *vera*. For the 16th century, the same is shown by the very fact that a signature of more than one flat was thought to produce a 'feigned scale' (see the preceding note).

<sup>27</sup> The assumption that a transposed system represented *musica vera* was made in C. Dahlhaus, 'Zur Akzidentiensetzung in den Motetten Josquins des Prez', in *Musik und Verlag: Karl Vötterle zum 65. Geburtstag am 12. April 1968* (Kassel, 1968), 207ff. Elaborate hypotheses were erected on this assumption in M. Bent, 'Musica Recta and Musica Ficta', and A. Hughes, *Manuscript Accidentals: Ficta in Focus 1350–1450*, MSD, xxvii (1972).

<sup>28</sup> For the most important papers on the subject see E. E. Lowinsky, 'The Function of Conflicting Signatures'; R. H. Hoppin, 'Partial Signatures and Musica Ficta in Some Early 15th-century Sources', *JAMS*, vi (1953), 197–215; Lowinsky, 'Conflicting Views on Conflicting Signatures', *JAMS*, vii (1954), 181–204; Hoppin, 'Conflicting Signatures Reviewed', *JAMS*, ix (1956), 97–117.

<sup>29</sup> See John Hothby, *Spetie tenore del contrapunto prima*, in Hothby, *De arte contrapuncti*, ed. G. Reaney, CSM, xxvi (1977), 86; Aaron, *Toscanello*, sig. Iiir; Aaron, *Trattato*, chap.3, sig.br. See also G. Reaney, 'Transposition and "Key" Signatures in Late Medieval Music', *MD*, xxxiii (1979), 31f.

<sup>30</sup> This makes sense of Hoppin's valuable discovery ('Partial Signatures and Musica Ficta') of the frequent correlation between signatures differing by one flat and voice ranges differing by a fifth: vertical imperfect fifths are most likely to occur between parts the ranges of which are a fifth apart.

<sup>31</sup> 'The Function of Conflicting Signatures', 234 and *passim*.

<sup>32</sup> From Tinctoris through to the end of the 16th century most theorists considered the tenor to be the mode-defining part, but it is possible that in some genres, styles or textures another voice could have this role. See especially H. S. Powers, 'Mode', *Grove6*, xii, 400, and B. Meier, 'Die Handschrift Porto 714 als Quelle zur Tonartenlehre des 15. Jahrhunderts', *MD*, vii (1953), 175–97.

<sup>33</sup> The following summary is based on the most substantial discussions of the prohibition in Jacques de Liège, *Speculum musice*, bk6, pp.59, 138f; Pseudo-Tunstede, *Quatuor principalia musicae*, in *CS*, iv, 247f; Tinctoris, *Liber de natura*, 73–6; Ramos de Pareia, *Musica practica*, 37; Nicolaus Burtius, *Florum libellus*, ed. G. Massera (Florence, 1975), 90; Franciscus de Brugis, 'Opusculum', in G. Massera, *La 'mano musicale perfetta' di Francesco de Brugis dalle prefazioni ai corali di L. A. Giunta, Venezia, 1499–1504* (Florence, 1963), 82, 87f; Gonzalo Martínez de Bizcargui, *Arte de canto llano*, ed. A. Seay (Colorado Springs, 1979), 17–20; Aaron, *Toscanello*, 'Aggiunta'; Aaron, *Lucidario in musica*, bk1, oppenioni viii, x and f.13v.

<sup>34</sup> For particularly interesting discussions of the prohibition on which the following summary

is based, s 287.

<sup>35</sup> The foll. *gregoriana* chichte, xi 10; Martir Lago, *Bre* f.30r; Zarli

<sup>36</sup> The foll. Pseudo-Tu 66, 99f; Fr.

<sup>37</sup> Glarean

<sup>38</sup> Marchet *regularum a* Gaffurius, Zarlino, *L*

<sup>39</sup> See for c

<sup>40</sup> See for f.16r; Niko

<sup>41</sup> See for sig.Ciiijv;

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is based, see Ramos de Pareia, *Musica practica*, 50; Zarlino, *Le istituzioni harmoniche*, 203, 236, 287.

<sup>35</sup> The following summary is based primarily on Nicolaus Wollick, *Opus aureum*, in *Die Musica gregoriana des Nicolaus Wollick*, ed. K. W. Niemöller, Beiträge zur rheinischen Musikgeschichte, xi (Cologne and Krefeld, 1955), 46; Ornithoparchus, *Musice active*, bk1, chaps.7 and 10; Martin Agricola, *Musica choralis deudsch* (Wittenberg, 1533/R1969), chap.8; Giovanni del Lago, *Breve introductione di musica misurata* (Venice, 1540), 40; Aaron, *Lucidario in musica*, f.30r; Zarlino, *Le istituzioni harmoniche*, 236f.

<sup>36</sup> The following summary is based primarily on Jacques de Liège, *Speculum musice*, bk6, p.60; Pseudo-Tunstedt, *Quatuor principalia musicae*, CS, iv, 215; Ramos de Pareia, *Musica practica*, 66, 99f; Franciscus de Brugis, 'Opusculum', 74, 78; Ornithoparchus, *Musice active*, bk1, chap.6.

<sup>37</sup> Glarean, *Dodecachordon*, 22.

<sup>38</sup> Marchetto da Padova, *Lucidarium*, 245-57, 430-33; John Hothby, *Tractatus quarundam regularum artis musicae, I-Fn* pal.472, f.10r; Ramos de Pareia, *Musica practica*, 66; Franchinus Gaffurius, *Practica musicae* (Milan, 1496), bk1, chap.4; Aaron, *Lucidario in musica*, ff.8v-9r, 30v; Zarlino, *Le istituzioni harmoniche*, 170.

<sup>39</sup> See for example Prosdocimus de Beldemandis, *Tractatus plane musice, I-Lg* 359, f.57r-57v.

<sup>40</sup> See for example Cochlaeus, *Tetrachordon musices*, sigs.Fr-Fv, examples; Vanneo, *Recanetum*, f.16r; Nikolaus Listenius, *Musica* (Nuremberg, 1549/R1927), chap.5.

<sup>41</sup> See for example Georg Rhau, *Enchiridion utriusque musicae practicae* (Wittenberg, 1538), sig.Ciiijv; Martin Agricola, *Musica choralis deudsch*, chap.4. For a most forceful statement against those who use *fa* above *la* indiscriminately, see Aaron, *Lucidario in musica*, bk1, oppenione viii and f.4v.

<sup>42</sup> See especially the most substantial comment on this matter in Aaron, *Toscanello*, 'Aggiunta'. See also Domingo Marcos Durán, *Lux bella* (Seville, 1492), [p.6]; Durán, *Comento sobre Lux bella* (Salamanca, 1498), [p.59].

<sup>43</sup> See n.12 above. E. E. Lowinsky's hypothesis that a small group of Franco-Flemish motets of mid-16th century conceal a 'secret chromatic art' consisting to a large extent of such 'chain reactions' depends on whether one finds the claim of a similarly experimental (or 'secret') status of the repertory plausible or not. See Lowinsky, *Secret Chromatic Art in the Netherlands Motet* (New York, 1946), and Lowinsky, 'Secret Chromatic Art Re-examined', in *Perspectives in Musicology*, ed. B. S. Brook, E. O. D. Downes and S. V. Solkema (New York, 1972), 91-135.

<sup>44</sup> See for example Philippe de Vitry, *Ars nova*, ed. G. Reaney, A. Gilles and J. Maillard, CSM, viii (1964), 22; Petrus frater dictus Palma ociosa, *Compendium*, 514f; Philippus de Caserta, *Regule contrapuncti*, in N. Wilkins, 'Some Notes on Philipoctus de Caserta (c1360?-c1435)', *Nottingham Mediaeval Studies*, viii (1964), 96; Prosdocimus de Beldemandis, *Contrapunctus*, 62-5, 78-81; Ugolino of Orvieto, *Declaratio*, bk2, pp.31, 44-7; Tinctoris, *Liber de natura*, 73ff, 81; Ornithoparchus, *Musice active*, bk1, chap.10; Vanneo, *Recanetum*, ff.15r, 74v.

<sup>45</sup> That the prohibition of *mi* against *fa* included the imperfect fourth can be seen clearly, for example, in Zarlino, *Le istituzioni harmoniche*, 169ff.

<sup>46</sup> See for example Philippus de Caserta, *Regule contrapuncti*, 99; Franchinus Gaffurius, *Extractus parvus musice*, ed. F. A. Gallo (Bologna, 1969), 128. For the distinction between *causa necessitatis* and *causa pulchritudinis*, see E. E. Lowinsky, 'Foreword', *Musica nova*, ed. H. C. Slim, MRM, i (1964), pp.v-xxi.

<sup>47</sup> Tinctoris, who disapproves of this exception, informs us that it was the common practice of his time and includes illuminating examples in *Liber de arte contrapuncti, Opera theoretica*, bk2, pp.143f. That the exception continued to be practised in the 16th century may be inferred from Giovanni del Lago, letter to Piero de Justinis, Venice, 3 June 1538, *I-Rvat* lat.5318, ff.102v-3r; Aaron, *Lucidario in musica*, ff.6v-7v, 14r; Aaron, *Compendiolo di molti dubbi, segreti et sentenze intorno al canto fermo, et figurato* (Milan, [after 1545]), chap.68; Zarlino, *Le istituzioni harmoniche*, 169f, 180f, 197f, 248f.

<sup>48</sup> See the examples in Tinctoris's text referred to in the preceding note.

<sup>49</sup> This we learn from Zarlino, *Le istituzioni harmoniche*, 180f, who adds that it was also the practice of some of the musicians of the past.

<sup>50</sup> Some theorists add the provision that the discord should last no longer than a part of the 'beat' (*mensura, tactus* or *battuta*). See Ramos de Pareia, *Musica practica*, 65; Gaffurius, *Practica musicae*, sig.ddiv; Spataro, letter to Aaron, Bologna, 27 November 1531, *I-Rvat* lat.5318, f.228r; del Lago, letter to de Justinis, *ibid*, ff.102v-3r; Aaron, *Lucidario in musica*, f.7v.

<sup>51</sup> Adrianus Petit Coclico, *Compendium musices* (Nuremberg, 1552/R1954), sigs.[Iivv]-Mr.

<sup>52</sup> Zarlino, *Le istituzioni harmoniche*, 177-80.

## Interlude

<sup>53</sup> See Jerome Cardan, *De musica*, in *Opera*, x (Lyons, 1663), 106.

<sup>54</sup> See especially J. Haar, 'False Relations and Chromaticism in Sixteenth-century Music', *JAMS*, xxx (1977), 391–418. See also J. van Benthem, 'Fortuna in Focus: Concerning "Conflicting" Progressions in Josquin's *Fortuna dun gran tempo*', *TVNM*, xxx (1980), 1–50; T. Noblitt, 'Chromatic Cross-relations and Editorial *Musica Ficta* in Masses of Obrecht', *TVNM*, xxxii (1982), 30–44; R. Toft, 'Pitch Content and Modal Procedure in Josquin's *Absalon, fili mi*', *TVNM*, xxxiii (1983), 3–27.

<sup>55</sup> Prosdocius de Beldemandis, writing between 1425 and 1428, appears to have been the only theorist who considered the question in terms of whether it is preferable to inflect the lower or upper voice and even he concluded that one could inflect either the tenor or discant, but if both solutions sounded equally good, it was better to inflect the discant, because a change in the tenor might produce a clash with another voice written against it. *Contrapunctus*, 94f.

<sup>56</sup> See for example Tinctoris, *Liber de natura*, 73f, 81; Burtius, *Florum libellus*, 122; Ghiselin Danckerts, *Trattato sopra una differentia musicale*, I-Rv R56, f.407r.

<sup>57</sup> See for example Vitry, *Ars nova*, 22; Petrus frater dictus Palma ociosa, *Compendium*, 514ff; Philippus de Caserta, *Regule contrapuncti*, 98; Prosdocius de Beldemandis, *Contrapunctus*, 78–81; Ugolino of Orvieto, *Declaratio*, bk2, pp.45f.

<sup>58</sup> Tinctoris, *Liber de natura*, 75f.

<sup>59</sup> Giovanni del Lago, letter to Piero de Justinis, Venice, 3 June 1538, I-Rvat lat.5318, f.102r–102v.

<sup>60</sup> See for example Marchetto da Padova, *Lucidarium*, 239, 245ff, 257ff, 261ff, 335ff, 347, 353; Johannes de Muris, *Quilibet affectans*, in *CS*, iii, 59f; Petrus frater dictus Palma ociosa, *Compendium*, 513f; Prosdocius de Beldemandis, *Contrapunctus*, 80–87; Ugolino of Orvieto, *Declaratio*, bk2, pp.12f, 47f; bk3, p.248; Ramos de Pareia, *Musica practica*, 65ff; Burtius, *Florum libellus*, 118f; Gaffurius, *Practica musicae*, sigs.ddiiv–ddiir; Aaron, *Toscanello*, bk2, chap.14; Lanfranco, *Scintille di musica*, 116; Zarlino, *Le istituzioni harmoniche*, 156f, 188, 190, 235f.

<sup>61</sup> See for example Gaffurius, *Extractus parvus musicae*, 128, 75.

<sup>62</sup> For the sources of the following summary, see especially Johannes Tinctoris, *Terminorum musicae diffinitorium* ([Treviso, 1475]), sig.iiiir; Hothby, *Tractatus quarundam regularum artis musicae*, f.12r–12v; Gaffurius, *Practica musicae*, sig.ddiir; *Die Musica figurativa des Melchior Schanppecher*, ed. K. W. Niemöller, Beiträge zur rheinischen Musikgeschichte, ii/50 (Cologne and Krefeld, 1961), 26f; Cochlaeus, *Tetrachordum musices*, sigs.[Eviz]–Fr; Ornithoparchus, *Musice active*, bk4, chaps.4–5; Pietro Aaron, *Libri tres de institutione harmonica* (Bologna, 1516/R1971), f.49r–49v; Vanneo, *Recanetum*, ff.75v, 77r, 85v–7v, 93v; Giovanni del Lago, *Breve introductione di musica misurata* (Venice, 1540), 37, 39f; Vicentino, *L'antica musica ridotta alla moderna practica* (Rome, 1555/R1959), ff.51v–2r, 53r–53v, 54v–8v; Zarlino, *Le istituzioni harmoniche*, 191, 193, 221–6, 250f, 320.

<sup>63</sup> See especially Aaron, *Toscanello*, bk2, chap.20 and 'Aggiunta', sigs.Iv–Iiir; Lanfranco, *Scintille di musica*, 126; Vicentino, *L'antica musica*, f.82r.

<sup>64</sup> See for example Prosdocius de Beldemandis, *Contrapunctus*, 84f; Aaron, *Libri tres*, ff.50r–50v; see also theoretical sources referred to in n.65 below.

<sup>65</sup> On these cadences, see especially Marchetto da Padova, *Lucidarium*, 263, 353; Petrus frater dictus Palma ociosa, *Compendium*, 515; Prosdocius de Beldemandis, *Tractatus musicae speculative contra Marchetum de Padua*, in D. R. Baralli and L. Torri, 'Il "Trattato" di Prosdocius de Beldomandi contro il "Lucidario" di Marchetto da Padova', *RMI*, xx (1913), 750ff; Ugolino of Orvieto, *Declaratio*, bk2, pp.51f; Ramos de Pareia, *Musica Practica*, 66f, 101; Anonymous, *Quot sunt concordationes*, in *CS*, iii, 73; Gaffurius, *Practica musicae*, sig.ceiir; Aaron, *Lucidario in musica*, ff.8v–9r; Lanfranco, *Scintille di musica*, 127; Vanneo, *Recanetum*, f.90r–90v. The Bent-Hughes hypothesis that the flat leading note was the normal choice for cadences on A because of the preference for the *recta bb* over the *ficta g#* (see n.27 above) ignores the fact that the great majority of theorists from the early 14th to the late 16th century who exemplified the treatment of cadences on A, used the sharp leading note.

<sup>66</sup> This is shown not only by theoretical evidence cited in the preceding note, but also by practical evidence of source accidentals. See especially H. M. Brown, 'Accidentals and Ornamentation in Sixteenth-century Intabulations of Josquin's Motets', in *Josquin des Prez: New York 1971*, 475–522.

<sup>67</sup> See Ramos de Pareia, *Musica practica*, 101.

<sup>68</sup> See the evidence listed in n.60 above.

<sup>69</sup> Private communication from Professor Howard M. Brown.

<sup>70</sup> See, in addition to the evidence referred to in the following note, Lockwood, 'A Dispute on Accidentals', 38f.

<sup>71</sup> Zarlino elucidated 54.

<sup>72</sup> For evidence of the scribble <sup>73</sup> *Guillaume*

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<sup>71</sup> Zarlino, *Le istituzioni harmoniche*, 212–20. The theorist's discussion has been thoroughly elucidated in J. Haar, 'Zarlino's Definition of Fugue and Imitation', *JAMS*, xxiv (1971), 226–54.

<sup>72</sup> For evidence that 'conflicting signatures . . . seem to have been added arbitrarily, at the whim of the scribe', see Brown, 'Introduction', 160–67.

<sup>73</sup> *Guillaume Dufay: Opera omnia*, ed. H. Besseler, CMM, i/3 (1951), 119f, bars 72–8.

<sup>74</sup> In his 'Accidentals and Ornamentation in Sixteenth-century Intabulations', Howard Mayer Brown has demonstrated how much may be learned in this respect from a judicious evaluation of lute intabulations of vocal models. We have just as much to learn from accidentals in sources of vocal polyphony. Some fruitful research has already been conducted along these lines (see especially the literature referred to in n.54 above), but much remains to be done.

<sup>75</sup> For the assumptions which should govern editors of early polyphony in matters concerning implied accidentals, see especially I. Lockwood, 'A Sample Problem of *Musica Ficta*: Willaert's *Pater Noster*', in *Studies in Music History: Essays for Oliver Strunk* (Princeton, 1968), 161–82.

<sup>76</sup> In his work on the methodology of relating sources which share concordances, Allan Atlas concluded, in *The Cappella Giulia Chansonnier* (Rome, *Biblioteca Apostolica Vaticana*, C.G.XIII.27), *Musicological Studies*, xxvii/1 (Brooklyn, 1975), 39–48, that source accidentals belong to those 'notational characteristics that do not indicate that the sources that share them are necessarily related, since their nature is such that two or more scribes could very well have happened upon them quite independently of one another' (*ibid.*, p.46). The conclusion should probably be revised to exclude the 'unconventional' source accidentals.

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